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The Industry · University
Center for Glass Research

Center for Glass Research

New York State College of Ceramics at Alfred University

Benefits of advanced glass research extend from improved techniques and products to increased energy efficiency for the industry

A National Science Foundation Industry/ University Cooperative Research Center since 1986

Center Mission and Rationale

The Center for Glass Research was formed in 1985 by a core group of glass industry representatives. Following a national competition involving 11 universities, an ad hoc committee representing the U.S. glass industry decided to locate the Center at Alfred University. From a charter membership of 8 corporate sponsors, the Center has grown into a research consortium comprised of more than 30 glass manufacturers, glass users, suppliers to the glass industry, and universities. The mission of the Center is to advance the field of glass science and engineering through research, education, and technology exchange driven by the cooperative efforts of academe, industry, and government.

Research Program

The research program is divided into seven major categories that reflect the interests of the Center members. The areas of research include —

- Advanced glassmaking
- Properties of glass-forming melts
- Secondary processing
- Advanced glass research
- Surfaces of glass
- Modeling and predictions
- Materials for glassmaking.

The research program of the Center covers nearly every aspect of glass science and engineering, with an emphasis on the fundamentals of glassmaking. Results have been incorporated into the glass-making process by the Center members. The research projects are selected and evaluated by the corporate sponsors at semiannual meetings. Most of the research sponsored by the Center is conducted at Alfred University by engineering and science faculty and graduate students. Collaborative research is carried out at affiliate organizations in Germany, Russia, and the United States.

A major goal of the Center is to provide a state-of-the-art test facility for use by its members. The New York State College of Ceramics has a full complement of equipment and analytical facilities that can be used to investigate nearly all areas of interest to glass scientists and engineers. These include specialized glass melting and processing facilities; equipment for measurement of the properties of glasses and their melts; electron and optical microscopes; Mössbauer,

Raman spectroscopy is used to study defects in glass.

Raman, UV, visible, and IR spectrometers; and a variety of x-ray analysis equipment. Center members routinely use these facilities for specialized studies.

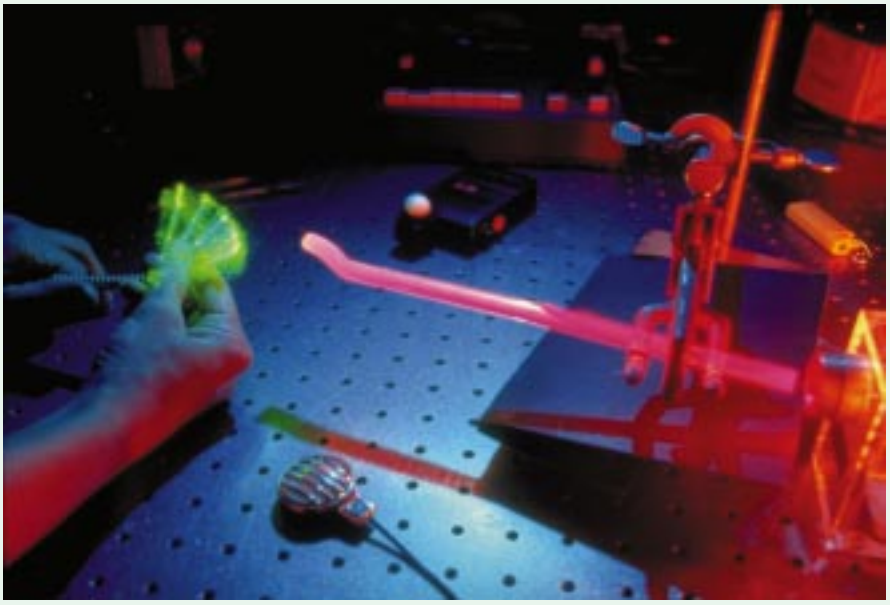
Members may also sponsor proprietary research projects to augment the main research program of the Center. Proprietary projects have included such topics as ion-exchange strengthening of glass, the effects of oxy-fuel firing on the viscosity of glass melts, ultrasonic melting and fining of glass, and development of statistical property-composition models.

Special Center Activities

The presence of the Center at Alfred University was instrumental in establishment of the first graduate program in the United States for a Ph.D. in glass science. Several students in this program are currently supported by the Center. The results of the Center's research program have been successfully incorporated into the corporate research plans of its member companies, resulting in substantial savings and more efficient research strategies. Research at the Center resulted in the development of a process that strengthens glasses by ion-exchange, which represents a major breakthrough in the manufacture of glass for architectural use. One of the research thrusts led to the creation of a process control algorithm that has found widespread use in the industry. Selected activities and accomplishments of the Center are listed below.

Plasma technique is used to deposit thin films on glass surfaces.

- Participating in the NSF-sponsored Young Scholars Program for high school students and a summer internship program for minority and disabled students
- Hosting of scientists and engineers from member companies to do research at Alfred University under the Visiting Scientist program of the Center.
- Establishment of a semiannual technical journal, "*The GlassResearcher: Bulletin of Glass Science and Engineering,"* which has a circulation of over 7,000
- Collaboration with the Center for Process Analytical Chemistry at the University of Washington



Advances in glass sciences are expanding the uses of fiber optics and lasers.

- Sponsorship of research at Virginia Military Institute and Howard University
- Co-funding of research projects with the Center for Advanced Ceramic Technology at the New York State College of Ceramics at Alfred University
- Establishment of a scientific collaboration with a counterpart center in Germany, Hüttentechnische Vereinigung der Deutschen Glasindustrie
- Sponsorship of research at the Institute of Silicate Chemistry, St. Petersburg, Russia
- Initiation of new series of international glass conferences, "Advances in the Fusion and Processing of Glass"
- Organization of a "National Glass Day" in Washington, D.C., to increase awareness of glass science and technology on the national level
- Facilitation of interaction between the national laboratories and members of the Center
- Research meeting with the National Glass Forum, of Japan in Tokyo, 1995
- Conducting a workshop on Modeling for the Glass Industry, in collaboration with the U.S. Department of Energy Office of Industrial Technologies.

Whether it is traditional glass or advanced glass, most are formed by melting.

Center Headquarters

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NSF 93-97q (rev. 7/96)